

# Frequency Mixer WIDE BAND

## SIM-193H+

Level 17 (LO Power +17 dBm) 7.3 to 19 GHz



CASE STYLE: HV1195

**+RoHS Compliant**  
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

**Available Tape and Reel at no extra cost**

Reel Size	Devices/Reel
7"	10, 20, 50, 100, 200, 500

### Maximum Ratings

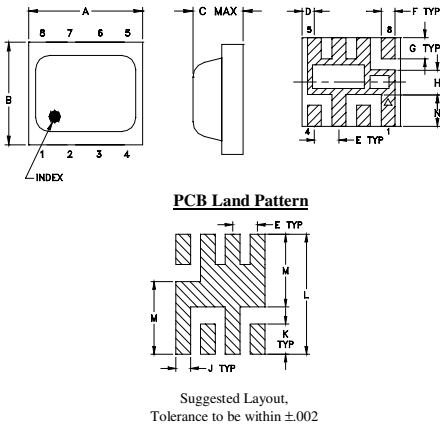
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	120mW

For extended temperature range, consult factory.  
Permanent damage may occur if any of these limits are exceeded.

### Pin Connections

LO	8
RF	4
IF	2
GROUND	1,3,5,6,7

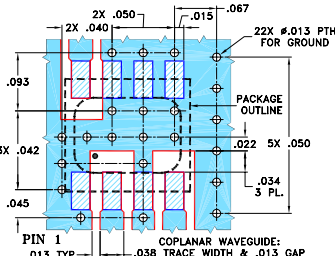
### Outline Drawing



### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.200	.180	.087	.025	.050	.028	.043
5.08	4.57	2.21	0.64	1.27	0.71	1.09
H	J	K	L	M	N	wt
.050	.030	.060	0.238	0.144	0.065	grams
1.27	0.76	1.52	6.05	3.66	1.65	0.08

### Demo Board MCL P/N: TB-458+ Suggested PCB Layout (PL-284)



- NOTES:
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015", COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
    - DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
    - DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/WCLStore/terms.jsp](http://www.minicircuits.com/WCLStore/terms.jsp)

### Features

- wide bandwidth, 7.3 to 19 GHz
- low conversion loss, 6.2 dB typ.
- high L-R isolation, 33 dB typ.
- excellent IF BW, DC to 7.5 GHz
- LTCC double balanced mixer
- tiny size, low profile, 0.08"
- useable as up and down converter
- aqueous washable
- protected under U.S. Patent 7,027,795

### Applications

- fixed satellite
- mobile
- radio location

### Electrical Specifications at 25°C

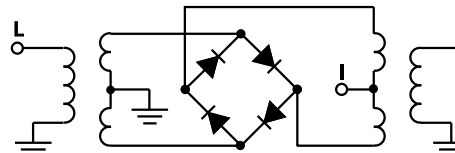
Parameter	Condition (GHz)	Min.	Typ.	Max.	Unit
Frequency Range, LO/RF		7.3	—	19	GHz
Frequency Range, IF		DC	—	7.5	GHz
Conversion Loss <sup>1</sup>	7.3-10	—	8.6	10.5	dB
	10-15	—	7.6	10.0	
	15-18	—	9.7	11.8	
	18-19	—	10.0	13.0	
LO to RF Isolation	7.3-10	24	32	—	dB
	10-15	20	28	—	
	15-18	16	21	—	
	18-19	20	26	—	
LO to IF Isolation	7.3-10	13	18	—	dB
	10-15	13	18	—	
	15-18	8	11	—	
	18-19	12	17	—	
IP3	7.3-10	—	17	—	dBm
	10-15	—	19	—	
	15-18	—	16	—	
	18-19	—	25	—	
RF Input Power at 1 dB Compression	7.3-19	—	+14	—	dBm

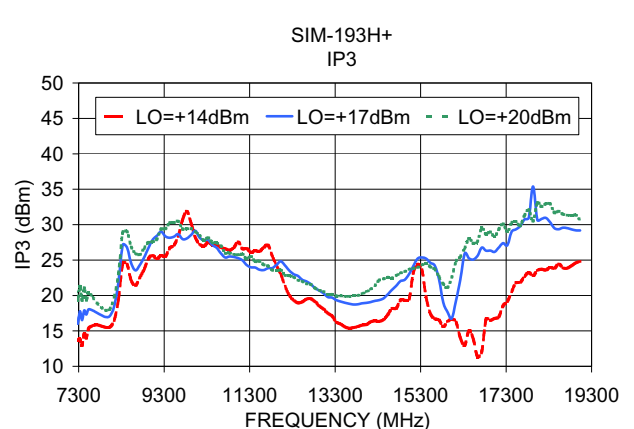
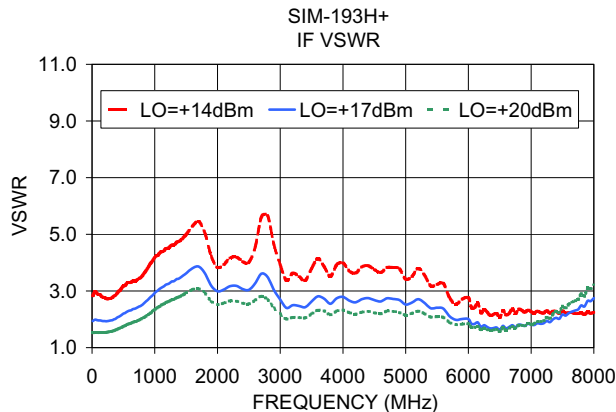
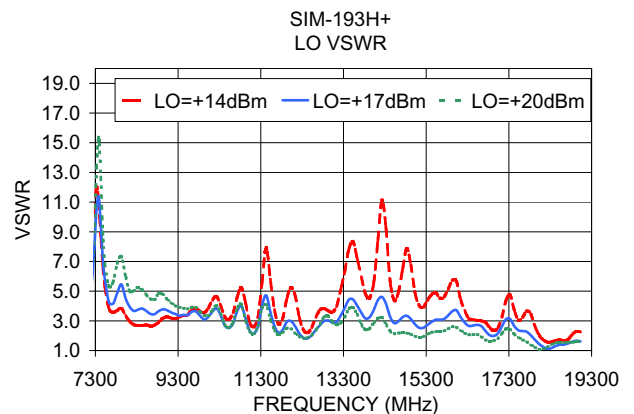
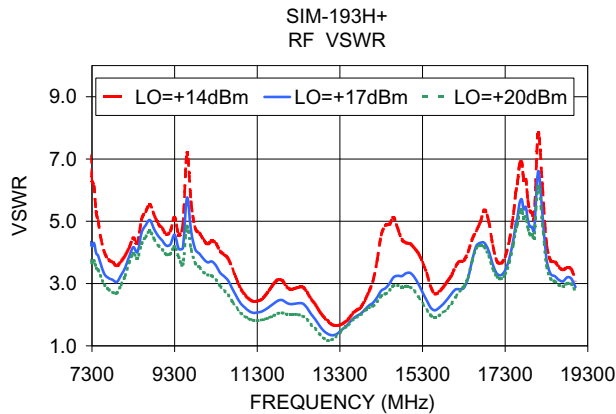
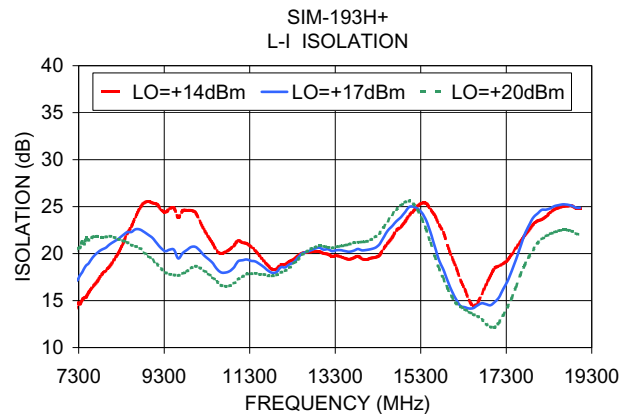
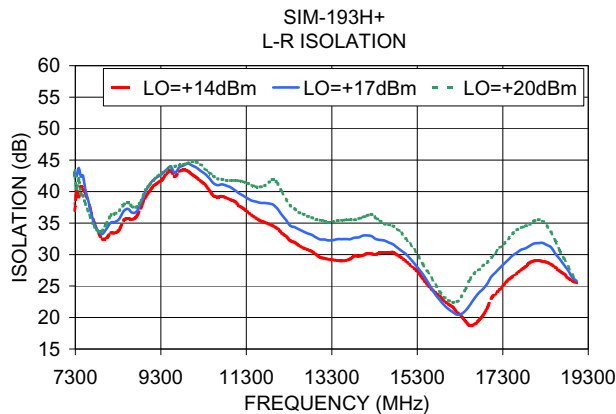
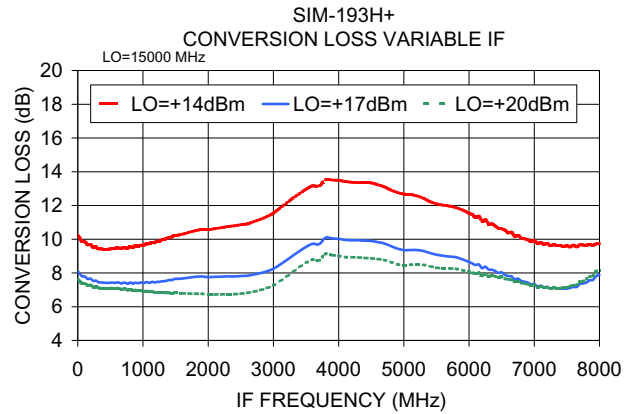
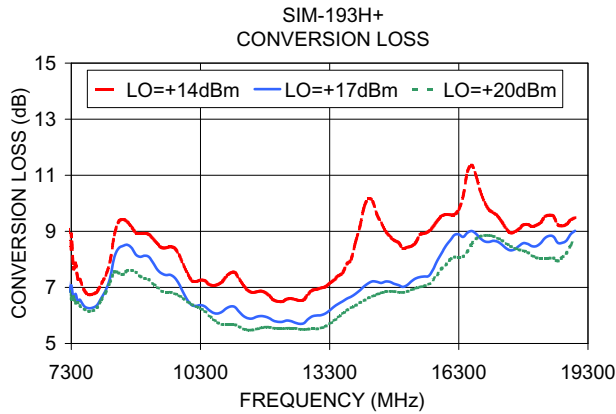
1. Conversion loss at 30 MHz IF.

### Typical Performance Data

Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +17dBm	LO +17dBm	LO +17dBm	LO +17dBm	LO +17dBm
7300.10	7330.00	7.07	42.48	17.69	4.20	10.62
8500.10	8530.00	8.48	37.26	22.30	4.64	3.67
9000.10	9030.00	8.13	41.03	21.66	4.38	3.72
9500.10	9530.00	7.44	43.94	20.41	4.15	3.39
10000.10	10030.00	6.54	44.16	20.71	3.79	3.26
11000.10	11030.00	6.32	40.24	19.18	2.23	2.34
11500.10	11530.00	5.89	38.41	18.90	2.17	3.62
12000.10	12030.00	5.81	37.27	18.55	2.39	2.98
12500.10	12530.00	5.74	34.00	20.03	2.23	2.03
13000.10	13030.00	6.00	32.41	20.42	1.39	2.90
14000.10	14030.00	6.89	33.02	20.39	2.29	3.72
14500.10	14530.00	7.16	32.23	22.45	3.00	2.84
15000.10	15030.00	7.02	30.11	24.95	3.34	2.77
15500.10	15530.00	7.39	25.82	22.24	2.22	3.08
16000.10	16030.00	8.48	21.35	16.00	2.67	3.72
16500.10	16530.00	8.95	21.99	14.20	3.74	2.73
17000.10	17030.00	8.62	26.46	14.84	3.61	2.14
17500.10	17530.00	8.32	29.85	19.38	4.43	2.36
18000.10	18030.00	8.47	31.75	24.25	4.67	1.44
19000.10	19030.00	9.02	25.80	24.87	2.89	1.62

### Electrical Schematic





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